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Research letter

Tattooing: A national survey in the general population of France

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To the Editor: The prevalence of tattooing in France was estimated at 14% in 2016 [1, 2]. We report a national survey among a non-selected sample of the general French population. The survey was conducted online between April and August 2017 among 5000 individuals ≥ 15 years selected using a stratified random sampling method from a database including over 1,000,000 Internet users who agreed to participate in various panel surveys. We enquired about socio-demographics, smoking, skin conditions, tattoo(s) and body-piercings (BP, ear lobe excluded), motivations for getting tattooed, and cutaneous side-effects. Quality of life (QoL) was evaluated using the SF-12® health survey.

The prevalence of tattooed people was 16.8% (**table 1**, 9.9% with 1 tattoo, 6.9% with >1). Thirty-seven percent of the tattooed individuals had ≥ 1 BP. Tattooed individuals were more likely to smoke (44.8% vs. 23.5%, $p < 0.01$), especially those with >1 tattoo (49.3% vs. 41.8%, $p = 0.03$). Women were more likely to have only one tattooed area (51.5% vs. 44.1%, $p = 0.008$) and men to be heavily tattooed: 13.6% of the them had tattoos on ≥ 5 areas versus 8.4% of the women ($p = 0.01$).

Men had their first tattoo younger than women (24.0 ± 8.9 vs. 26.5 ± 10.5 , $p < 0.001$). Age at first tattoo was lower for those who had previously discussed it with their parents (20.4 ± 5.3 vs. 26.5 ± 10.4) and 28% of the minors < 18 y made their decision alone. Sexuality was a strong driving factor for men and body reclamation for women. Multivariate analysis showed that being ≤ 25 years old at the time of tattooing was associated with testing one's own stamina (OR=10; 95% CI: 3.59-28.5; $p < 0.0001$) and body embellishment (OR=1.74; 95% CI: 1.23-2.45; $p = 0.0002$). Men were more likely to get at a tattoo for individuality (OR=1.49; 95% CI: 1.08-2.06; $p = 0.015$), for cultural or religious motives (OR=2.37 95% CI: 1.25-4.50; $p = 0.008$) and for sexuality (OR=2.18; 95% CI: 1.27-3.73; $p = 0.0048$). Regaining one's body was a strong driving motivation for women, and the lack of a reason was prominent among the elderly (OR=2.11; 95% CI: 1.35-3.29; $p < 0.0001$). Tattooed individuals were more likely to

report acne, contact eczema and atopic dermatitis (**Table 2**). Seventeen percent reported past or present cutaneous problem on one of their tattoos. Irritation was the most common (41%), followed by infection (25%), delay in healing (24%), and itch (22%). Tattooed men had more often problems on their tattoos (26%, vs. 11.3%, $p < 0.01$). Those reporting complications were also significantly younger (30.2 ± 9.7 vs. 38.5 ± 13.2 y, $p < 0.0001$). Multivariate analyses are summarized in **table 2**.

Having tattoo(s) was associated with lower physical and mental QoL, especially for those with >1 tattoo. Linear regression analysis confirmed that lower physical ($p < 0.001$) and mental ($p = 0.0098$) scores were significantly associated with having >1 tattoo.

Our results illustrate the overall trend in Western countries. Tattooing is associated with lower quality of life scores, especially those with several ones. Only 1.9% reported chronic cutaneous complaints on one of their tattoos [3]. The question whether atopic dermatitis/contact eczema is more frequently associated with tattoo irritation or if tattooing is responsible for atopic dermatitis/contact eczema should be investigated.

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Tables

Table 1. Characteristics of the study population

	Total <i>n=5000</i>	Male <i>n=2443</i>	Female <i>n=2557</i>	p-value
Prevalence by gender				
	840 (16.8)	351 (14.4)	489 (19.1)	p<0.001
Prevalence by age groups (years)				
15-24; n = 802	189 (23.5)	72 (18)	117 (29.1)	<0.001
25-34; n = 790	213 (26.9)	92 (23.6)	121 (30.2)	<0.001
35-49; n = 1302	274 (21)	115 (17.7)	159 (24.4)	<0.001
50-64; n = 1256	144 (11)	66 (10.9)	78 (11.9)	NS
65-80; n = 850	20 (2.3)	6 (1.5)	14 (3.1)	NS
Tattoos by anatomic distribution				
Back	417 (49.6)	124 (35.4)	293 (59.9)	<0.0001
Shoulder	297 (35.4)	216 (61.7)	81 (16.6)	<0.0001
Forearm	266 (31.7)	117 (33.4)	149 (30.5)	NS
Leg	165 (19.6)	56 (16.0)	109 (22.3)	0.02
Trunk	136 (16.2)	67 (19.1)	69 (14.1)	NS
Foot	87 (10.4)	20 (5.7)	67 (13.7)	0.0002
Hand	85 (10.1)	36 (10.3)	49 (10.0)	NS
Intimate area/genital	83 (9.9)	37 (10.6)	46 (9.4)	NS
Neck	59 (7.0)	19 (5.4)	40 (8.1)	NS
Face	53 (6.3)	18 (5.1)	35 (7.2)	NS
Number of anatomic tattooed areas				
1	407 (48.4)	155 (44.1)	252 (51.5)	0.008
2	199 (23.7)	89 (25.4)	110 (22.5)	NS
3	89 (10.6)	35 (10.0)	54 (11.0)	NS
4	56 (6.7)	24 (6.8)	32 (6.5)	NS
5	24 (2.9)	11 (3.1)	13 (2.7)	NS
6	21 (2.5)	12(3.4)	9 (1.8)	NS
7	6 (0.7)	3 (0.85)	3 (0.6)	NS
8	9 (1.1)	3 (0.85)	6 (1.2)	NS
9 and more	29 (3.4)	19 (5.4)	10 (2.0)	0.035
Tattoo decision making: alone or discussion with family or friends*				
Alone	486 (57.8)	210 (59.8)	276 (56.4)	NS
Parents	143 (17.0)	68 (19.3)	75 (15.3)	NS
Family	101 (12.0)	39 (11.1)	62 (12.7)	NS
Friends	108 (12.8)	32 (9.1)	76 (15.5)	0.006
Significant other	92 (10.9)	28 (8.0)	64 (13.1)	0.02
Self-reported motivations for getting tattooed**				

Body embellishment	245 (28.5)	93 (25.7)	152 (30.6)	NS
Individuality, distinction	195 (22.7)	96 (26.5)	99 (19.9)	0.02
Body appropriation	116 (13.5)	34 (9.4)	82 (16.5)	0.003
Eroticism, sexuality	59 (6.9)	35 (9.7)	24 (4.9)	0.005
Commitment	48 (5.6)	23 (6.3)	25 (5.0)	NS
Tradition, culture	42 (4.9)	26 (7.2)	16 (3.2)	0.008
Endurance/stamina	19 (2.2)	6 (1.6)	13 (2.6)	NS
No reason	323 (37.6)	122 (33.7)	201 (40.4)	0.04
Quality of life SF-12	1 tattoo	>1 tattoo	No tattoos (reference)	p-value
Physical composite score	51.2±8.2 -	- 49.9±7.9	51.2±8.3	NS 0.007
Mental composite score	41.3±10.1 -	- 41.6±9.1	44.4±9.5	<0.001 <0.0001

NS: not significant

*Total over 100% as respondents could give several answers

**The overall respondent's number is 859: 19 non-tattooed individuals, who had their tattoo removed self-reported their motivations for getting tattooed.

Table 2. Skin conditions and self-reported side effects in tattooed population

Skin conditions				
	Tattooed n=840	Non-tattooed n=4160		p-value
Acne	115 (13.7)	408 (9.8)		0.0008
Contact eczema	69 (8.2)	185 (4.4)		0.000006
Psoriasis	45 (5.4)	199 (4.8)		NS
Atopic dermatitis	41 (4.9)	144 (3.5)		0.046
Rosacea	29 (3.4)	158 (3.8)		NS
Vitiligo	5 (0.5)	18 (0.4)		NS
Adverse skin reaction in tattoo, self-reported				
Past or present	146 (17)	-		-
Solved	92 (10.9)	-		-
Wax and waning	38 (4.5)	-		-
Current	16 (1.9)	-		-
Adverse event symptoms		1 tattoo n=495	>1 tattoos n=345	
Delayed healing	35 (4.2)	13 (2.6)	22 (6.4)	0.007
Irritation	61 (7.3)	19 (3.8)	42 (12.2)	0.000005
Infection	37 (4.4)	8 (1.6)	29 (8.4)	0.000002
Itch	32 (3.8)	12 (2.4)	20 (5.8)	0.012
Multivariate analyses of self-reported tattoo complications*				
Adverse event	Significant variable	OR [95% CI]; p-value		
Delay in healing	Man gender	3.72 [1.73:8.00]; 0.0008		
	Age < 25 yo	2.29 [1.12:4.70] ; 0.023		
	Contact eczema	2.71 [1.09:6.76] ; 0.03		
Irritation	Man gender	3.00 [1.68 :5.37] ; 0.0002		
	Multiple tattoos	2.95 [1.64 :5.28] ; 0.0003		
	Atopic eczema	4.80 [2.10 :11.0] ; 0.0002		
	Any skin disease	3.01 [1.70:5.31] ; 0.0001		
Infection	Multiple tattoos	4.86 [2.17 :10.9] ; 0.0001		
	Any skin disease	2.43 [1.21 :4.92] ; 0.013		
Itch	Age < 25 yo	2.75 [1.33 :5.68] ; 0.01		

NS: not significant

*analysed variables: age < 25 and > 55 yo, gender, tobacco, acne, contact eczema, atopic dermatitis, psoriasis and any skin disease